

PROJECT PROFILE



FTW336B BARRACKS, FORT WAINWRIGHT, AK

35.4% reduction in energy costs
(LEED)

33.6% reduction in water use

78.8% of construction waste
diverted from the landfill

LEED Facts

FTW336b Barracks,
Fort Wainwright, AK

LEED for New Construction Version 2.2
Certification awarded August 27, 2012

Gold 41

Sustainable Sites 9/14

Water Efficiency 4/5

Energy & Atmosphere 12/17

Materials & Resources 3/13

Indoor Environmental Quality 8/15

Innovation & Design 5/5

*Out of a possible 69 points

FTW336B BARRACKS, FORT WAINWRIGHT, AK

Alaska Barracks earns LEED Gold

PROJECT BACKGROUND

The 276-person Barracks on Fort Wainwright, AK, was a fast-track design-build project by Kiewit Building Group and Design Alaska, Inc. This 100,000+ SF, three-story building is comprised of two-bedroom apartments with a full kitchen and dining area. There is a generous recreation area on the second story of the core tower with large south-facing windows that provide a view of the Alaska Range Mountains. This barracks received LEED Gold certification with special energy-saving features being a key element. Annual savings in cost of operation is a major plus, especially in this subarctic region where the average winter temperature is below zero. The use of high-efficiency mechanical equipment, a building envelope with a high R-value, and occupancy sensors saved 35.4% in energy costs when compared to a baseline building from ASHRAE 90.1-2004. Other special features include low water usage, use of low VOC materials and finishes as well as steps to ensure indoor air quality throughout construction and use of products with recycled content. The building also incorporates a high level of acoustical and ICC separation so noise from neighboring units is minimal.

IAQ VS. ENERGY TRADEOFF

This military residential project was required to allow for smoking in some of the apartments. This created a challenge for the mechanical engineers to contain the Environmental Tobacco Smoke (ETS) in these rooms, ensuring superior indoor air quality for other occupants, while avoiding large heat losses and pressure imbalances. By negatively pressurizing these bedrooms, heat loss due to ventilation was increased, but the designers were still able to achieve 50% energy savings.

A unique aspect of this region of Alaska is that cars are required to be plugged in when temperatures are below freezing. Regular "head-bolt" plug-ins draw current constantly when a car is plugged in. As a way to save energy, as well as money, we installed "Intelligent Parking Lot Controllers" (IPLCs). IPLCs are individual parking head bolts controls that measure temperature and wind chill and are factory-programmed to regulate the optimum power flow to ensure vehicles start at any temperature. The IPLCs in the parking lot are projected to save over 65,000 kWh of electricity every year.

STRATEGIES AND RESULTS

In this extremely cold region, the enormous heating demand must be met with a superb building envelope and efficient heating systems. Air-tight construction, triple-pane windows, R-11 doors, R-41 walls and R-62 roof combined with a heat recovery ventilator (HRV) and radiant slab heating system tackle this challenge. In addition, all the hot water and space heating for this project is provided by steam from Ft. Wainwright's combined heat and power plant, reducing fuel consumption and atmospheric emissions.

In addition to an excellent building envelope, other energy loads were reduced dramatically to achieve a 50% energy reduction. Exterior lighting was reduced by over 60%. Advanced motors and variable frequency drive (VFDs) reduce the building's electrical loads, while economizer cooling and window shading reduce cooling loads. Enhanced Commissioning was utilized to ensure optimal performance of the building's energy systems and assists proper maintenance for long-term efficiency. Demand Controlled Ventilation (DCV) reduces heat loss through ventilation make-up air, and a fully integrated Direct Digital Control (DDC) system automatically manages the thermal and ventilation systems to optimize performance. All exterior lighting is hooded and interior lighting is designed to minimize light trespass. Over 285,000 square feet of habitat was preserved during construction, and another 177,000 square feet was restored with native and adapted species, amounting to a 72% habitat protection. Preferred parking for carpools and a centralized ride-share board encourages building users to reduce their transportation footprint.

NOTABLE LEED FEATURES

- 100% of exterior lighting is hooded and all indoor light is designed to stay inside to reduce light pollution
- 72% of the project site (excluding building footprint) consists of protected or restored habitat
- 97% cool/reflective roof
- 100% Water Use Reduction (Landscaping)
- 34% Water Use Reduction (Fixtures & Fittings)
- Enhanced Commissioning and Refrigerant Management
- Enhanced Indoor Air Quality during Construction - Full Building Flushout prior to occupancy
- Occupancy Sensor Lighting Control Systems
- Low-VOC materials and MERV 13 filters
- Acoustical attenuation accomplished with STC50 wall and floor assemblies



U.S. Army Engineer District, Alaska

Owner: U.S. Army Engineer District, Alaska
Architects: Design Alaska, Inc.
Structural Engineers: Design Alaska, Inc.
Energy Modeling: Design Alaska, Inc.
Civil Engineer: Design Alaska, Inc.
Landscape Architect: Design Alaska, Inc.
Interior Designer: Design Alaska, Inc.
Contractors: Kiewit Building Group
Commissioning Agent: Support Services of Alaska
Electrical Engineer: Design Alaska, Inc.
Sustainable Design Consultant: Design Alaska, Inc.

Project Size: 107,604 square feet

Total Project Cost: \$47,060,000

Cost Per Square Foot: \$437

Photographs Courtesy of: Ken Graham Photography

ABOUT LEED

The LEED green building certification program is the national benchmark for the design, construction, and operations of green buildings. Visit the U.S. Green Building Council's Web site at www.usgbc.org to learn more about LEED and green buildings.

Public Affairs Office
 907.753.2721
 Alaska District
 907.353.6701
 Fort Wainwright



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